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IS 15165 (2002): Tebuconazole, Technical [FAD 1: Pesticides and Pesticides Residue Analysis]

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भारतीय मानक

टीब्यूकोनाजोल, तकनीकी — विशिष्टि

Indian Standard

TEBUCONAZOLE, TECHNICAL — SPECIFICATION

ICS 65.100.30

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

October 2002

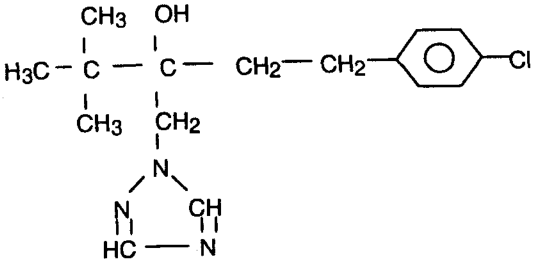
Price Group 2

Pesticides Sectional Committee, FAD 1

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Pesticides Sectional Committee had been approved by the Food and Agriculture Division Council.

Tebuconazole, technical is employed in the preparation of fungicidal formulation. Tebuconazole is the accepted common name by the International Organization for Standardization (ISO) for (RS)-1-*p*-chlorophenyl-4, 4-dimethyl-3-(1H-1, 2, 4-triazole-1-ylmethyl) pentan-3-ol. The empirical and structural formulae and molecular mass of tebuconazole are given below:

Empirical Formula	*Structural Formula*	*Molecular Mass*
$C_{16}H_{22}ClN_3O$		307.8

In the preparation of this standard, due consideration has been given to the provisions of the *Insecticides Act*, 1968 and the Rules framed thereunder. However this standard is subject to the restrictions imposed under the Act and Rules, wherever applicable.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules *for rounding off numerical values (revised)*'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

TEBUCONAZOLE, TECHNICAL — SPECIFICATION

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for tebuconazole technical.

2 REFERENCES

The following Indian Standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
1070 : 1992	Reagent grade water (*third revision*)
5682 : 1991	Open top drums and kegs (*first revision*)
6940 : 1982	Methods of test for pesticides and their formulations (*first revision*)
7601 : 1983	Fibreboard drums for general purpose (*first revision*)
8069 : 1989	High density polyethylene (HDPE) woven sacks for packing pesticides (*second revision*)
8190 (Part 1) : 1988	Requirement for packing of pesticides: Part 1 Solid pesticides (*second revision*)
10946 : 1996	Methods of sampling for technical grade pesticides (*first revision*)

3 REQUIREMENTS

3.1 Description

The material shall be in the form of colourless to beige lumps or powder. It shall be devoid of hard aggregates and free from extraneous impurities.

3.2 The material shall also comply with the requirements given in Table 1

4 PACKING

The material shall be packed either in mild steel drums or in fibreboard drums or in HDPE woven sacks. Polyliners of thickness not less than 0.062 mm shall be used in each case. Mild steel drums shall conform to IS 5682. Fibreboard drums shall conform to IS 7601. HDPE woven sacks shall conform to IS 8069. The material shall meet the general requirements given in IS 8190 (Part 1).

Table 1 Requirement for Tebuconazole, Technical

(*Clauses* 3.2 *and* 7.1)

Sl No.	Characteristic	Requirement	Method of Test, Ref to	
			Annex of this Standard	Cl No. of IS 6940
(1)	(2)	(3)	(4)	(5)
i)	Tebuconazole content, percent by mass, *Min*	93.0	A	–
ii)	Moisture content, percent by mass, *Max*	0.50	–	4.1
iii)	Alkalinity as NaOH, percent by mass, *Max*	0.60	–	11.3

5 MARKING

5.1 The container shall bear legibly and indelibly the following information in addition to any other information is required under the *Insecticides Act*, 1968 and Rules framed thereunder:

a) Name of the material;
b) Name and address of the manufacturer;
c) Date of manufacture;
d) Date of expiry;
e) Batch number;
f) Nominal tebuconazole content, percent by mass;
g) Net mass of contents; and
h) Any other information required under the *Insecticides Act*, 1968 and Rules framed thereunder; and *Standards of Weights and Measures (Packaged Commodities) Rules*, 1977.

5.2 BIS Certification Marking

The product may also be marked with the Standard Mark.

5.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 SAMPLING

Representative samples shall be drawn as prescribed in IS 10946.

7 TESTS

7.1 Tests shall be carried out by the methods referred to in col 4 and 5 of Table 1.

7.2 Quality of Reagents

Unless specified otherwise, pure chemicals and reagent grade water (*see* IS 1070) shall be employed in the tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

ANNEX A

[*Table* 1, *Sl No.* (i)]

DETERMINATION OF TEBUCONAZOLE CONTENT

A-1 PRINCIPLE

A-1.1 Tebuconazole content is determined by gas chromatography using internal standard technique.

A-2 APPARATUS

A-2.1 Gas Chromatograph (GLC)

Equipped with FID and coupled to a printer-plotter-cum-integrator. The operative conditions suggested below are typical, which can be changed provided the standardization is done:

Column : Glass, 1.2 m length, 3 mm i.d., packed with 10 percent OV-101 on chromosorb WHP (100/120 mesh)

Temperatures :

a) Column oven — 250 °C
b) Injection port — 250 °C
c) Detector — 300 °C

Gases and corresponding flow rates:

a) Nitrogen (carrier) — 30 ml/min
b) Hydrogen — 30 ml/min
c) Air — 300 ml/min

A-2.2 Microlitre Syringe — 5/10 µl

A-2.3 Glasswares

A-3 REAGENTS

A-3.1 Acetone — AR grade or equivalent.

A-3.2 Internal Standard — Dioctyl Phthalate (DOP) — AR grade or equivalent.

A-3.3 Tebuconazole Reference Standard — of known purity.

A-4 PROCEDURE

A-4.1 Preparation of Internal Standard Solution

Weigh accurately 2 g of DOP into a 100 ml volumetric flask. Dissolve in acetone and make up the volume upto the mark with acetone. Shake well to homogenize.

A-4.2 Preparation of Standard Solution

Weigh accurately 0.2 g of tebuconazole reference standard of known purity into a 100-ml volumetric flask. Dissolve in acetone. Add 10 ml of internal standard solution and make up the volume with acetone up to the mark. Shake well to homogenize.

A-4.3 Preparation of Sample Solution

Weigh accurately a quantity of a sample equivalent to 0.2 g of tebuconazole into a 100 ml volumetric flask. Dissolve in acetone. Add 10 ml of internal standard solution and make up the volume with acetone up to the mark. Shake well to homogenize.

A-4.4 Estimation

A-4.4.1 Inject 2 µl of reference standard solution into the gas chromatograph until two consecutive chromatograms do not differ from each other by more than 2 percent. Then use the following sequence.

$$\ldots.\ C, S_1, S_1, C, S_2, S_2, C, \ldots.$$

where

C = standard solution, and
S = sample solution.

From the chromatograms of standard solution and sample solution measure the peak areas of internal standard and tebuconazole peaks and compute the percentage of tebuconazole as given in **A-5**.

A-4.4.2 *Retention Times (Guide Values)*

Tebuconazole	8.15 min
Internal standard (DOP)	10.24 min
Total run time	15 min

A-5 CALCULATIONS

$$\text{Tebuconazole content, percent by mass} = \frac{M_1 \times A_3 \times A_2 \times P}{M_2 \times A_4 \times A_1}$$

where

M_1 = mass in g of standard tebuconazole in standard solution,

M_2 = mass in g of the sample taken for test,

A_1 = peak area of tebuconazole in the chromatogram of standard solution,

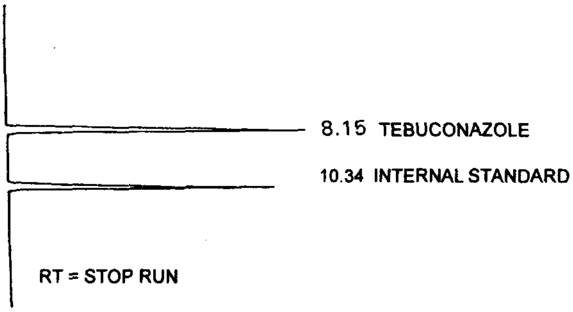
A_2 = peak area of tebuconazole in the chromatogram of sample solution,

A_3 = peak area of internal standard in the chromatogram of standard solution,

A_4 = peak area of internal standard in the chromatogram of sample solution, and

P = percentage purity of tebuconazole reference standard.

A typical chromatogram is given below:



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